EE331

3.7
4.5

QUIZ #1

Name: Kyle Ness

- 45 Minutes, No materials allowed. (number) indicates weighting.

1. How do we 2's complement a hex number? Please describe two ways using "$73A_{16}$". (0.5)

-0.3

You can convert to binary two's compliment then convert back to hex _or_ you can subtract each Hex digit from F and then add 1.   show

2. Implement the expression $AB + \overline{AB}$ using only _one_ gate. (0.5)

XNOR $A \oplus B$

A	B	
0	0	1
0	1	0
1	0	0
1	1	1

3. Show two three-bit shift registers connected so that the contents of the X register will be serially transferred (shifted) into register Y using D flip-flops for each shift register. If original value of X register is "101", what is the content of Y registers after second pulse? (1)

Assuming [Y] = 000 at start contents of [Y] will be 010 after second pulse

Shift
Pulse
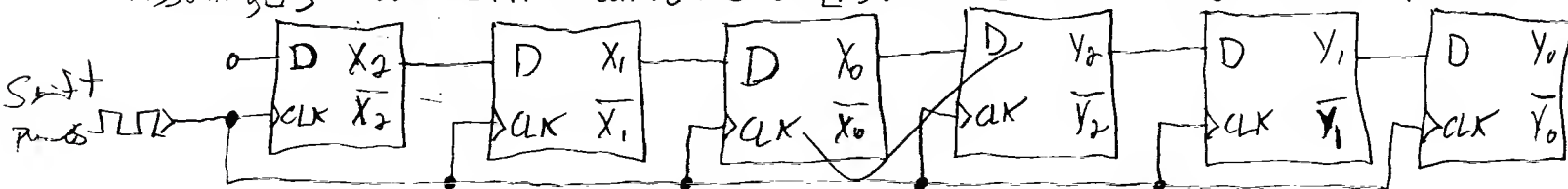
4. A certain memory has a capacity of 128K × 8. (a) How many data input and data output lines does it have? (b) How many address lines does it have? (c) What is its capacity in bytes? (1.5)

-2

a) it will have 8 data O/p I/p lines as its word size is 8
b) It will have $2^{17} = 128K$ 17 address lines
c) It's capacity in bytes is 128K b/c each word is 8 bits or 1 byte long and it can hold 128K words.

5. It is desired to combine several 2K × 8 PROMs to produce a total capacity of 16K × 8. How many PROM chips are needed? How many address lines are required? Provide address range for each PROMs in Hex. (1.5)

-0.5

You will need 8 PROM chips. You will require 14 address lines consisting of 3 lines going to a 3 to 8 decoder to select which chip and 11 lines to select the address from the chip $2^{11} = 2048 (2K)$.

1   2   3   4   5
0000-07FF, 0800-0FFF, 1000-17FF, 1800-1FFF, 2000-27FF

6. Department of Electrical Engineering, University of Saskatchewan

6   7   8
2800-2FFF, 3000-37FF, 3800-3FFF